



## Complete Summary

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### TITLE

Diabetes mellitus: lower-extremity amputation rate.

### SOURCE(S)

AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 3.0a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 58 p.(AHRQ Pub; no. 02-R0203).

## Measure Domain

### PRIMARY MEASURE DOMAIN

Population Health

The validity of measures depends on how they are built. By examining the key building blocks of a measure, you can assess its validity for your purpose. For more information, visit the [Measure Validity](#) page.

### SECONDARY MEASURE DOMAIN

Access

## Brief Abstract

### DESCRIPTION

This measure is used to assess the number of admissions for lower-extremity amputation among patients with diabetes per 100,000 population.

As a Prevention Quality Indicator (PQI), lower-extremity amputations among patients with diabetes is not a measure of hospital quality, but rather one measure of outpatient and other health care. PQIs are correlated with each other and may be used in conjunction as an overall examination of outpatient care.

### RATIONALE

Prevention is an important role for all health care providers. Providers can help individuals stay healthy by preventing disease, and they can prevent complications of existing disease by helping patients live with their illnesses. To fulfill this role, however, providers need data on the impact of their services and

the opportunity to compare these data over time or across communities. Local, State, and Federal policymakers also need these tools and data to identify potential access or quality-of-care problems related to prevention, to plan specific interventions, and to evaluate how well these interventions meet the goals of preventing illness and disability.

While these indicators use hospital inpatient data, their focus is an outpatient health care. Except in the case of patients who are readmitted soon after discharge from a hospital, the quality of inpatient care is unlikely to be a significant determinant of admission rates for ambulatory care sensitive conditions. Rather, the Prevention Quality Indicators (PQIs) assess the quality of the health care system as a whole, and especially the quality of ambulatory care, in preventing medical complications. As a result, these measures are likely to be of the greatest value when calculated at the population level and when used by public health groups, State data organizations, and other organizations concerned with the health of populations.

These indicators serve as a screening tool rather than as definitive measures of quality problems. They can provide initial information about potential problems in the community that may require further, more in-depth analysis.

Diabetes is a major risk factor for lower-extremity amputation, which can be caused by infection, neuropathy, and microvascular disease.

Proper and continued treatment and glucose control may reduce the incidence of lower-extremity amputation.

#### PRIMARY CLINICAL COMPONENT

Diabetes mellitus; lower-extremity amputation; hospital admission rates

#### DENOMINATOR DESCRIPTION

Population in Metro Area or county, age 18 years and older

#### NUMERATOR DESCRIPTION

Discharges, age 18 years and older, with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure codes\* for lower-extremity amputation in any field and diagnosis code\* for diabetes in any field. Discharges with trauma, patients transferring from another institution, or Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium) are excluded.

\*Refer to Technical Specifications document cited in the "Companion Documents" field for ICD-9-CM codes.

### Evidence Supporting the Measure

#### EVIDENCE SUPPORTING THE VALUE OF MONITORING THE ASPECT OF POPULATION HEALTH

- One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

## Evidence Supporting Need for the Measure

### NEED FOR THE MEASURE

Monitoring health state(s)  
Variation in health state(s)

### EVIDENCE SUPPORTING NEED FOR THE MEASURE

AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 3.0a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 58 p. (AHRQ Pub; no. 02-R0203).

## State of Use of the Measure

### STATE OF USE

Current routine use

### CURRENT USE

Monitoring health state(s)

## Application of Measure in its Current Use

### CARE SETTING

Ambulatory Care  
Community Health Care

### PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Advanced Practice Nurses  
Physician Assistants  
Physicians  
Public Health Professionals

### LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Counties or Cities

### TARGET POPULATION AGE

Age greater than or equal to 18 years

## TARGET POPULATION GENDER

Either male or female

## STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

### Characteristics of the Primary Clinical Component

## INCIDENCE/PREVALENCE

Lower-extremity amputation (LEA) affects up to 15% of all patients with diabetes in their lifetimes.

## EVIDENCE FOR INCIDENCE/PREVALENCE

Mayfield JA, Reiber GE, Sanders LJ, Janisse D, Pogach LM. Preventive foot care in people with diabetes (technical review). *Diabetes Care* 1998 Dec; 21(12):2161-77. [PubMed](#)

## ASSOCIATION WITH VULNERABLE POPULATIONS

Unspecified

## BURDEN OF ILLNESS

Unspecified

## UTILIZATION

Unspecified

## COSTS

Unspecified

### Institute of Medicine National Healthcare Quality Report Categories

## IOM CARE NEED

Living with Illness

## IOM DOMAIN

Effectiveness  
Timeliness

CASE FINDING

Both users and nonusers of care

DESCRIPTION OF CASE FINDING

Population in Metro Area or county, age 18 years and older

DENOMINATOR SAMPLING FRAME

Geographically defined

DENOMINATOR INCLUSIONS/EXCLUSIONS

Inclusions

Population in Metro Area or county, age 18 years and older

Exclusions

Unspecified

RELATIONSHIP OF DENOMINATOR TO NUMERATOR

All cases in the denominator are not equally eligible to appear in the numerator

DENOMINATOR (INDEX) EVENT

Patient Characteristic

DENOMINATOR TIME WINDOW

Time window is a single point in time

NUMERATOR INCLUSIONS/EXCLUSIONS

Inclusions

Discharges, age 18 years and older, with International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure codes\* for lower-extremity amputation in any field and diagnosis code\* for diabetes in any field

\*Refer to Technical Specifications document cited in the "Companion Documents" field for ICD-9-CM codes.

Exclusions

Discharges with trauma, patients transferring from another institution, or Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium) are excluded.

## MEASURE RESULTS UNDER CONTROL OF HEALTH CARE PROFESSIONALS, ORGANIZATIONS AND/OR POLICYMAKERS

The measure results are somewhat or substantially under the control of the health care professionals, organizations and/or policymakers to whom the measure applies.

### NUMERATOR TIME WINDOW

Institutionalization

### DATA SOURCE

Administrative data

### LEVEL OF DETERMINATION OF QUALITY

Does not apply to this measure

### TYPE OF HEALTH STATE

Adverse Health State

### PRE-EXISTING INSTRUMENT USED

Unspecified

## Computation of the Measure

### SCORING

Rate

### INTERPRETATION OF SCORE

A lower score is desirable

### ALLOWANCE FOR PATIENT FACTORS

Analysis by subgroup (stratification on patient factors, geographic factors, etc.)  
Risk adjustment method widely or commercially available

### DESCRIPTION OF ALLOWANCE FOR PATIENT FACTORS

Observed (raw) rates may be stratified by areas (Metro Areas or counties), age groups, race/ethnicity categories, and sex.

Risk adjustment of the data is recommended using age and sex.

Application of multivariate signal extraction (MSX) to smooth risk adjusted rates is also recommended.

#### STANDARD OF COMPARISON

External comparison at a point in time  
External comparison of time trends  
Internal time comparison  
Prescriptive standard

#### PRESCRIPTIVE STANDARD

Healthy People 2010 has set a goal of reducing the number of lower-extremity amputations to 1.8 per 1,000 persons with diabetes.

#### EVIDENCE FOR PRESCRIPTIVE STANDARD

U.S. Department of Health and Human Services. Healthy people 2010: understanding and improving health. Conference ed. Washington (DC): Government Printing Office; 2000.

### Evaluation of Measure Properties

#### EXTENT OF MEASURE TESTING

Each potential quality indicator was evaluated against the following six criteria, which were considered essential for determining the reliability and validity of a quality indicator: face validity, precision, minimum bias, construct validity, fosters real quality improvement, and application. The project team searched Medline for articles relating to each of these six areas of evaluation. Additionally, extensive empirical testing of all potential indicators was conducted using the 1995-97 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) and Nationwide Inpatient Sample (NIS) to determine precision, bias, and construct validity. Table 1 in the original measure documentation summarizes the results of the literature review and empirical evaluations on the Prevention Quality Indicators (PQI). Refer to the original measure documentation for details.

#### EVIDENCE FOR RELIABILITY/VALIDITY TESTING

AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 3.0a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 58 p.(AHRQ Pub; no. 02-R0203).

### Identifying Information

#### ORIGINAL TITLE

Rate of lower-extremity amputation among patients with diabetes (PQI 16).

## MEASURE COLLECTION

[Agency for Healthcare Research and Quality \(AHRQ\) Quality Indicators](#)

## MEASURE SET NAME

[Agency for Healthcare Research and Quality \(AHRQ\) Prevention Quality Indicators](#)

## DEVELOPER

Agency for Healthcare Research and Quality

## ENDORSER

National Quality Forum

## ADAPTATION

This measure was not adapted from another source.

## RELEASE DATE

2001 Oct

## REVISION DATE

2006 Feb

## MEASURE STATUS

This is the current release of the measure.

This measure updates a previous version: AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 2.1, revision 4]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2004 Nov 24. 115 p. (AHRQ Pub; no. 02-R0203).

## SOURCE(S)

AHRQ quality indicators. Guide to prevention quality indicators: hospital admission for ambulatory care sensitive conditions [version 3.0a]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 58 p. (AHRQ Pub; no. 02-R0203).

## MEASURE AVAILABILITY

The individual measure, "Rate of Lower-Extremity Amputation among Patients with Diabetes (PQI 16)," is published in "AHRQ Quality Indicators. Guide to Prevention Quality Indicators: Hospital Admission for Ambulatory Sensitive Conditions." This document is available in [Portable Document Format \(PDF\)](#) from

the [Prevention Quality Indicators Download page](#) at the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators Web site.

For more information, please contact the QI Support Team at [support@qualityindicators.ahrq.gov](mailto:support@qualityindicators.ahrq.gov).

## COMPANION DOCUMENTS

The following are available:

- AHRQ quality indicators. Prevention quality indicators: technical specifications [version 3.0b]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 May 1. 20 p. (AHRQ Pub; no 02-R0202). This document is available in Portable Document Format (PDF) from the [Agency for Healthcare Research and Quality \(AHRQ\) Quality Indicators Web site](#).
- AHRQ quality indicators. Prevention quality indicators: software documentation [version 3a] - SAS. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 35 p. (AHRQ Pub; no. 02-R0202). This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- AHRQ quality indicators. Prevention quality indicators: software documentation [version 3a] - SPSS. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 32 p. (AHRQ Pub; no. 02-R0207). This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- AHRQ quality indicators. Software documentation: Windows [version 3.0]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 72 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- Prevention quality indicators (PQI): covariates, version 3.0a. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2006 Feb 20. 10 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- Remus D, Fraser I. Guidance for using the AHRQ quality indicators for hospital-level public reporting or payment. Rockville (MD): Agency for Healthcare Research and Quality; 2004 Aug. 24 p. This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- UCSF-Stanford Evidence-based Practice Center. Davies GM, Geppert J, McClellan M, et al. Refinement of the HCUP quality indicators. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2001 May. (Technical review; no. 4). This document is available in PDF from the [AHRQ Quality Indicators Web site](#).
- HCUPnet, Healthcare Cost and Utilization Project. [Internet]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2004 [Various pagings]. HCUPnet is available from the [AHRQ Web site](#).

## NQMC STATUS

This NQMC summary was completed by ECRI on December 19, 2002. The information was verified by the Agency for Healthcare Research and Quality on January 9, 2003. This NQMC summary was updated by ECRI on April 6, 2004, February 18, 2005, and again on February 27, 2006. The information was verified by the measure developer on July 31, 2006

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